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Intake Fishing Access Site Source Water Delineation and Assessment Report

Public Water Supply: Intake Fishing Access Site (PWSID #MT0042451)
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Introduction

This delineation and assessment report is intended to meet the technical requirements of the Montana Source Water Protection Program (DEQ, 1999) and the federal Safe Drinking Water Act (SDWA) Amendments of 1996 (P.L. 104-182). Jim Stimson, Hydrogeologist with the Montana Department of Environmental Quality (DEQ) prepared the final report with assistance from intern Briana Roach. Information on land use and potential contaminant sources comes from a variety of sources including a preliminary land cover data layer produced by the United States Geological Survey (USGS), DEQ Public Water Supply files (including sanitary surveys), and other public sources of information. A web-based GIS application is also used to query and generate maps to support writing this report. This application is called the Source Water Protection Program Query System and is available at the following web address or URL: <http://nris.mt.gov/wis/swap/swapquery.asp>. The application was developed by the DEQ Source Water Protection Program (SWPP) and provides access to data from the U. S. EPA, DEQ, Montana Bureau of Mines and Geology (MBMG) and other sources.

Purpose

The purpose of this delineation and assessment report is to assess threats to the Intake Fishing Access Site (FAS) water supply using information obtained from Fish, Wildlife, and Parks (FWP) personnel managing the site, the most recent sanitary survey completed in May 1988 by Gary Wilson (available from DEQ upon request), and from published reports. Delineation is a process whereby areas that contribute water to aquifers or surface waters used for drinking water are identified on a map. These areas are referred to as source water protection areas. Assessment involves identifying locations or regions in source water protection areas where contaminants may be generated, stored, or transported and then determining the potential for contamination of drinking water by these sources.

Public Water Supply Information

Intake FAS is located 16½ miles northeast of Glendive, Montana and consists of a picnic area and a campground ([Figure 1](#)). The Department of Fish, Wildlife and Parks operates this site. The site is served by a well (PWS Source ID 002) located near the southwest corner of the parking area.

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DEQ public water supply records indicate the water system serves 25 or more non-residents per day through one active service connection. Because the water supply does not regularly serve the same 25 persons for at least six months a year, it is classified as a transient, non-community public water supply. Water demand is approximately 125 gallons per day assuming five gallons per day per visitor (EPA, 1991). Sewage for the facility is collected in vault toilets.

According to well log data from the Montana Bureau of Mines and Geology (MBMG), the Intake FAS well is 70 feet deep and was drilled in June 1973. The well is constructed with 4-inch casing and yields six gallons per minute (gpm). The well log indicates that the well casing is perforated between the depths of 65 and 70 feet below land surface. The well has a pumping water level of 56 feet. The static water level is unknown. The well is completed in unconsolidated alluvium. Based on lithologic logs from thirteen nearby wells, the aquifer appears to be locally confined. On a larger scale the alluvial aquifer adjacent the Yellowstone River is interpreted to be unconfined, or at best semi-confined. Ground water in this area generally flows from upland areas toward local stream valleys and then eastward (Smith et al, 2000).

Water is drawn from the public water supply well by a hand-pump. No treatment is applied to the system. The sanitary survey indicates the well and pump appeared to be in good working order. However, it is common among hand-pumps for the pump housing to come loose from its support base, usually a concrete slab, creating direct access for potential contaminants into the well casing. Also, deterioration of the packing material between the hand-pump rod and pump housing can result in open spaces that act as pathways into the pump housing and well casing. In most cases, routine inspection and maintenance of the hand-pump addresses these concerns. Based on the 1988 sanitary survey and other information available in the DEQ PWS files, it is not clear whether or not the pump currently needs maintenance.

FWP is required to monitor for nitrate and coliform bacteria at Intake FAS. Levels of both contaminants detected in the public water supply well have been below the maximum allowable concentrations throughout the past five years. Nitrate and microbiological monitoring results are kept on file at DEQ.

Delineation

A 100-foot radius control zone and one-mile radius inventory region were delineated for Intake FAS as is required for transient, non-community public water supplies under the Montana Source Water Protection Program (DEQ, 1999). The control zone is the most critical area from which direct introduction of contaminants into the well or immediate area can occur. The inventory region encompasses the area from which water or contaminants can flow into the Intake FAS well over a period of months to years. Because the well is in close proximity to Yellowstone River, it is likely that the aquifer and the river are hydraulically connected. As a result, under certain conditions, the river could contribute water to the aquifer and consequently, to the well. For that reason, a surface water buffer zone is also delineated for Intake FAS. The surface water buffer extends one half mile around the river and contributing streams and canals up-

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stream a distance corresponding to a 4-hour time of travel (TOT) but not to exceed ten miles or beyond the limit of the watershed. The inventory and surface water buffer zones are combined on in [Figure 1](#) because contaminant inventory requirements are the same for both zones, for transient, non-community public water supplies.

Inventory

The Montana Source Water Protection Program (DEQ, 1999) requires that land uses and all potential sources of nitrate and microbial pathogens be identified within the control zone, inventory region, and surface water buffer zone of transient, non-community public water supplies.

The inventory shows that potential contaminant sources for this site include the on-site restrooms and agricultural land use. Restrooms at this site are small capacity vault toilets and they are not considered to be a significant potential contaminant source. However, agricultural land is considered a significant potential contaminant source due to the likelihood that agri-chemicals are used on the land. These substances include fertilizers which can be sources of nitrate.

Analysis of land use within the inventory region indicates the area surrounding the Intake FAS well is primarily grassland, shrub land, and forest land ([Figure 1](#)). These land cover types account for 75% of the land use within the inventory region and are not considered a threat to the Intake water source. Sixteen percent (16%) of the surrounding area is agricultural land and is included in the susceptibility analysis presented below.

Susceptibility Assessment

Susceptibility to potential contaminant sources is assessed both for the aquifer and the public water supply well. According to the Montana Source Water Protection Program criteria, an aquifer consisting of unconsolidated alluvium that is semi-confined is rated as moderately sensitive to potential sources of contamination (Table 2, Source Water Protection Program Document).

The relatively low percentage of agricultural land in the inventory region represents a low hazard for this public water supply (Table 6, Source Water Protection Program Document). With no other natural or engineered barriers identified, the aquifer is determined to have a moderate sensitivity to potential nitrate contamination from agricultural lands within the inventory region. Overall, the susceptibility of Intake FAS is low for pathogens and moderate for nitrate

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References:

- Montana DEQ, 1999. Montana Source Water Protection Program, Approved by EPA in November 1999.
- Smith, Larry N., LaFave, John I., Patton, Thomas W., Rose, James C., & McKenna, Dennis P., 2000. Ground-Water Resources of the Lower Yellowstone River Area: Dawson, Fallon, Prairie, Richland, and Wibaux Counties, Montana, Montana Bureau of Mines and Geology, 9 p.
- U.S. EPA, Office of Water, 1991. Manual of Small Public Water Supply Systems, EPA 570/9-91-003, 211 p.
- U.S. Geological Survey, 2000. National Landcover Dataset, Montana. 30-meter electronic digital landcover dataset interpreted from satellite imagery.
- Montana DEQ, 2000. Montana Source Water Protection Program, Template for Non-Community Transient Public Water Supplies.